

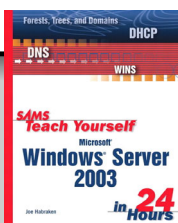
Content provided in partnership with [Sams](#), from the book [Sams Teach Yourself Microsoft Windows Server 2003 in 24 Hours](#) by [Joe Habraken](#)

Explore all the possibilities for your installation of Windows Server 2003. You will get all of the helpful tips you need to complete a successful installation or upgrade.

In this hour, we discuss the different types of Windows Server 2003 installations, such as upgrading an existing server or making a clean install on a server that is not currently configured with a network operating system. We also look at the Windows Server 2003 hardware requirements, server licensing issues, and server activation.

In this hour, the following topics are covered:

- Planning Windows Server 2003 installations
- Windows Server 2003 hardware requirements
- How to check Windows Server 2003 hardware and software compatibility on a server to be upgraded
- Working with server licensing
- Installing Windows Server 2003
- Upgrading a server to Windows Server 2003



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## Planning the Server Installation

Before you install Windows Server 2003 on a computer, particularly in cases when you are creating a new network infrastructure, you should create a map of what your network will look like. In particular, you should outline the servers and other resource devices, such as printers, that will provide your network clients with services. The role that a particular server will fill on the network should be determined long before you install the network operating system. The server's role, such as acting as a domain controller or a multihomed router (a Windows Server 2003 configured with more than one network interface card) or a NAT server, dictates not only the server's hardware configuration, but also the configuration of that server (and the services that it provides).



Hour 5, "Configuring a Windows Server," provides an overview on how to configure the various roles for a server, including such services as DNS, the file server, and the print server. Other hours in the book look at the specifics of configuring these various services. Hour 8, "Introduction to Active Directory," looks at the Active Directory namespace and provides the steps for making a Windows Server 2003 a domain controller.

Other issues related to the installation of Windows Server 2003 on a computer have to do with the computer's hardware configuration and its compatibility with Windows Server 2003. You must also be aware (before installation) of how you will configure client licensing on your network. Let's look at the Windows Server 2003 hardware requirements; then we can look at a quick way to check an existing server's upgrade compatibility and discuss server licensing issues.

## Server Hardware Requirements

Windows Server 2003 requires a minimum hardware configuration to run. As with all software—particularly network operating systems—the more you exceed the minimum requirements in areas such as RAM, processor speed, and hard drive space, the faster the server supplies services to network users and the greater the number of roles one server can fill on the network. (For example, a server could be a domain controller and could provide the DNS and DHCP services.)

Microsoft's suggested minimum hardware requirements (and some Microsoft recommendations) for Windows Server 2003 (Standard) are listed here:

- CPU speed: 133MHz (550MHz recommended)
- RAM: 128MB (256MB recommended; 4GB maximum on Standard Server)
- Disk space for setup: 1.5GB
- CD-ROM drive: 12X
- Monitor: Super VGA capable of providing 800 × 600 resolution

Not only must you meet the minimum hardware requirements to successfully install and run Windows Server 2003, but you also must have a server that provides hardware that is proven to be compatible with the network operating system. If you will use the server in a true production environment where you must supply mission-critical services to network users, your server hardware must come right off the Microsoft Windows Server 2003 Hardware Compatibility List. A copy of the list is available at

[www.microsoft.com/hwdq/hc1/scnet.asp](http://www.microsoft.com/hwdq/hc1/scnet.asp).



In my humble opinion, a good middle-of-the-road but somewhat “beefy” hardware configuration for a computer running Windows Server 2003 is a processor in excess of 900MHz, with 512MB of RAM and a SCSI drive array with at least three 20GB drives. Any server hardware configuration must address the capacity that will be required by the services that you run on the server and any server-side applications that you will deploy, such as Microsoft SQL Server or Microsoft Exchange Server.

## Checking Hardware and Software Compatibility

If you plan to upgrade a server that is running Windows NT 4 or Windows 2000 Server, you should probably run the hardware and software compatibility test provided on the Windows Server 2003 installation CD. This text lets you know if the server is configured with hardware that is not on the Windows Server 2003 Hardware Compatibility List, and it provides a list of any software running on the server that is not compatible with Windows Server 2003.

1. To run the Check System Compatibility utility, place the Windows Server 2003 CD in the CD-ROM driver of a currently running server.
2. The Welcome screen for the Windows Server 2003 family opens. Click the Check System Compatibility button on the screen.

3. On the next screen, you are given the option of checking the compatibility of the server's software and hardware automatically. A link is also provided to take you to the Windows Server 2003 Compatibility Web site, where you can check the hardware compatibility list. Select the option Check My System Automatically.
4. A Get Updated Files dialog box opens. This downloads additions to the hardware compatibility list from Microsoft (see Figure 3.1). Make sure the Download Updated Files option is selected, and then click Next.

**FIGURE 3.1**

*Allow the dynamic update from Microsoft.*



5. After the compatibility utility is upgraded dynamically, a screen appears listing any software or hardware compatibility issues on the server that you will want to upgrade. Drivers are software, so any driver that is found to be incompatible will be removed from the system when you upgrade to Windows Server 2003. This means that some legacy devices (such as an old modem) might not operate on the server. If there are also hardware issues, you should consider replacing the hardware component with a device on the hardware compatibility list.

## Understanding Server Licensing Issues

Another aspect of planning your Windows Server 2003 installation is determining whether you will license the clients that log on to your network servers. There are two licensing modes: per server and per seat. It's important that you choose the licensing mode that best suits your networking plan and the potential growth of your user base.

In *per server* mode, you are licensed for a certain number of concurrent connections to the server. If you have 50 licenses, 50 clients can connect to the server. Per server mode is the best choice when you have a small network consisting of only one domain (and one domain controller). It also works best for networks when only part of your client

base is connected to the server at any one time. For example, if you run different shifts at your company, you need only a per server license that covers the number of users connected to the server at any one time (not your entire employee population).

In *per seat* mode, you purchase a license for each network user on the network. Each of these users can connect to any and all the servers on the network. As far as large networks go, per seat mode is probably the best licensing strategy, especially if network resources are spread across a number of Windows Server 2003 servers.

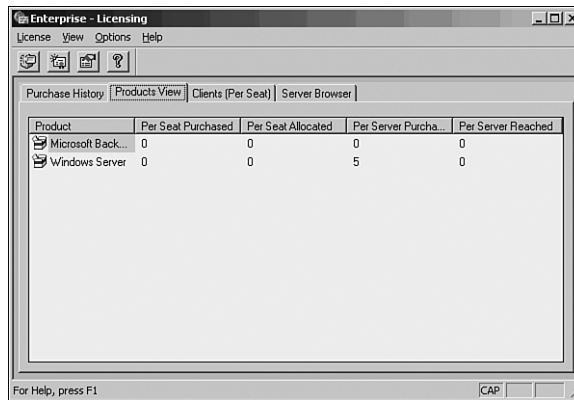
You must select your licensing mode during Windows Server 2003 installation. So, it is important to consider licensing in terms of network growth and usage.

However, if you select to use the per server licensing and then determine that it would make more sense to change to per seat licensing, you have one opportunity to switch licensing modes. This switch is done using the Licensing snap-in.

1. To open the Licensing snap-in, select Start, then Administrative Tools, and then Licensing. The Licensing snap-in opens in the Microsoft Management Console (see Figure 3.2).

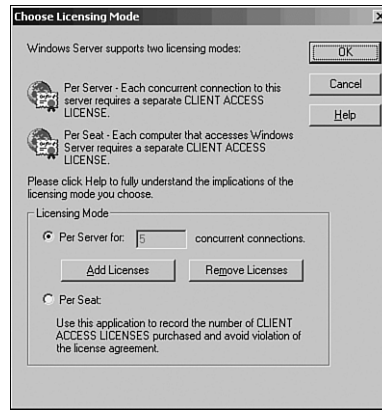
**FIGURE 3.2**

*The Licensing snap-in is used to record the various licenses for products that you use in your network environment.*



2. In the Licensing snap-in, select the Server Browser tab in the snap-in window. Then expand the domain (or workgroup) node. Right-click the Server icon (the local server) and select Properties. The Properties dialog box opens for the server and shows the current licensing mode for the server (and the number of licenses purchased).
3. To change the licensing mode from a server that is currently in per server mode, click the Edit button. The Choose Licensing Mode dialog box opens (see Figure 3.3).

**FIGURE 3.3**  
*Change the licensing mode to Per Seat.*



4. Select Per Seat and then click OK.
5. When you are using the per seat licensing mode, new licenses are added using the Licensing snap-in. Use the License command and then the New License command to record licenses for your Windows domain client licenses and other network products.



Microsoft has created some new licensing schemes for Microsoft Windows Server 2003. A new User Client Access license enables a user to connect to network services using any device, including computers and devices such as PDAs (this does not replace the Device Client Access licensing scheme currently in use in Windows 2000 and Windows Server 2003). External Connector licenses are also new and can be used by customers or partners to connect to license network services in the domain. Whatever licensing you use, the License snap-in provides you with a way of recording and tracking licensing on the network. For more information on Microsoft licensing, check out [www.microsoft.com/licensing/Default.asp](http://www.microsoft.com/licensing/Default.asp).

## Choosing to Upgrade or Make a Clean Installation

A major consideration related to a Windows Server 2003 installation is whether to upgrade in-place servers or do a clean install on a replacement server that will take over the role of a server or servers already on the network. For example, you might be running Windows 2000 Server on a computer that you want to replace (it might have seen better

days hardware-wise). You can install Windows Server 2003 on a new server and make it a domain controller in the Windows 2000 domain that already exists. This will allow the new server to replicate all the information in the Active Directory on the Windows 2000 Server (the Windows 2000 Server should have the latest service packs installed). You can then “retire” the Windows 2000 Server and use the Windows Server 2003 as the domain controller for the domain.

Whatever your strategy is for bringing new servers online on an existing network, you must deal with issues related to earlier versions of the Windows network operating system, such as Windows 2000 and Windows NT. The next two sections discuss issues related to upgrading these two versions of Windows server.

## Planning for a Windows 2000 Upgrade

Upgrading a server (even a domain controller) from Windows 2000 to Windows Server 2003 is a fairly easy process. Because Windows 2000 and Windows Server 2003 both embrace the Active Directory hierarchy and DNS namespace, the notion of forests, trees, and domains is common to both network operating systems. This means that a radical redesign of the network domain structure is not necessary.

However, you need to keep some things in mind when upgrading Windows 2000 Server to Windows Server 2003. First, you must make sure that the server’s hardware is compatible with Windows Server 2003 (as you would for a server that will get a clean installation). It is also important that you have installed Windows 2000 Server Service Pack 2 (or later, if available) on the server to upgrade the files in the Windows 2000 Server installation.

Finally, you must prepare the forest and the domain for the upgrade to Windows Server 2003. This is done using the `adprep` command-line utility found in the `i386` folder on the Windows Server 2003 CD-ROM. You actually have to run this upgrade program on the Schema Master and the Infrastructure Master on the domain. The *schema* is the database template for the Active Directory and defines the objects that can exist in the Active Directory (such as users, groups, and so on).



On smaller domains with a limited number of domain controllers, the Schema Master and the Infrastructure Master are the same Windows 2000 domain controller.

The Schema Master is typically the first server you brought online using Windows 2000 Server. It is the Schema Master because it defines the Active Directory schema for the

domain (the schema being the actual definition of the objects contained in the Active Directory). There is only one Schema Master per Windows 2000 forest (which can be many domains).

The Infrastructure Master is charged with the task of upgrading group and user associations. It keeps track of what groups users belong to. If group membership changes, the Infrastructure Master records this and then replicates it to the other domain controllers in the domain. When you create the first domain in a Windows 2000 forest, that domain controller is assigned the Infrastructure Master status.



To locate the Schema Master in your Windows 2000 domain, install the Active Directory Schema snap-in. It is part of the adminpak tools found in the i386 folder on the Windows 2000 Server CD (it is also in the same place on the Windows Server 2003 CD, but do not install the adminpak.msi file from the 2003 CD on the Windows 2000 server). After installation, open the Active Directory Schema snap-in. In the console tree, right-click Active Directory Schema and then click Operations Master. The name of the current domain-naming master (the Schema Master) appears in Current Operations Master.

Before you upgrade the Schema Master, back up the server and then disconnect this server from the network. Place the Windows Server 2003 CD in the server's CD-ROM drive. Open a command prompt and then switch to the CD's i386 folder. At the prompt, type **adprep /forestprep**. Then press Enter. If no errors are reported when the utility has completed running, you can hook the Schema Master back up to the network. It then replicates with the Infrastructure Master. (This can take a number of hours or even a day or so on a large network, so be patient.)

When you are ready to upgrade the Infrastructure Master, run the `adprep /forestprep` command, as outlined for the Schema Master. After giving the Infrastructure Master time to replicate with the other domain controllers on the network, you can then begin upgrading the domain controllers running Windows 2000 Server with Windows Server 2003.

## Planning for a Windows NT Upgrade

You can also upgrade a Windows NT domain (or domains) to a Windows Server 2003 domain. The first thing you should do is install NT Service Pack 5 to the servers running Windows NT 4 (also install any service packs on the server that have become available after Service Pack 5). You should also back up domain controllers and other specialized servers before performing the upgrades. In addition, you should check the server

hardware to see if it meets the requirements for Windows Server 2003, including hardware compatibility.

In the Windows NT networking environment, one primary domain controller is configured for each domain. The primary domain controller is aided by backup domain controllers that contain a copy of the primary domain controller's database.

You might want to upgrade member servers in the domain first. This enables you to bring services such as the Windows Server 2003 versions of DNS and DHCP online. The first domain controller that must be upgraded in the NT domain is the primary domain controller. You can then upgrade the backup domain controllers (which in the Windows Server 2003 environment are domain controllers because there is no such thing as a backup domain controller).

During the upgrade from Windows NT to Windows Server 2003, you will also want to allow the installation software to upgrade the system partition on your server to NTFS 5. Windows Server 2003 requires it for the Active Directory.



A lengthy discussion of transforming a Windows NT multidomain network into a Windows Server 2003 Active Directory hierarchy is beyond the scope of this book. However, one approach to upgrading multiple NT domains is to set up the Windows Server 2003 network that will replace it and then transfer user accounts and other domain information using a tool called the Active Directory Migration Tool (ADMT). This tool is available with the Windows Server 2003 Resource Kit.

## Using Supported File Systems

Windows Server 2003 supports the entire range of file systems supported by Microsoft operating systems. This ability was first introduced with Windows 2000 Server.

You can have FAT, FAT32, and NTFS partitions or volumes on your server's hard drives. A description of each file system follows:

- **FAT**—FAT volumes use a file allocation table that provides the name of the file and the location of the actual clusters that make up the file on the hard drive. FAT is a holdover from the days of DOS. I see no compelling reason to use FAT volumes on your servers.
- **FAT32**—FAT32 is an extension of the FAT file system. It uses disk space on a drive more efficiently than FAT and was designed for Windows 95/98.

- **NTFS**—NTFS 5 is the newest version of the NT file system (NTFS 5 was first introduced with Windows 2000 Server). It provides increased security for files on NTFS volumes and supports more robust file system recovery. Microsoft recommends that you use NTFS as your file system on your Windows servers. It is also required if you want to install Active Directory on a server to make it a domain controller.

It really makes sense to use NTFS volumes on your servers unless you need to create a dual-boot server on which a legacy operating system requires a FAT or FAT32 partition to run on the server. Actually, in most cases, it doesn't make sense to deploy a server on a network that was configured for dual-boot. NTFS provides the stability, the security, and other bells and whistles that makes it the appropriate choice for your server drive implementations.



Even the Home edition of Windows XP now supports NTFS volumes. FAT is definitely a file system antique. Although FAT32 is still recommended for home users, we might see its demise as newer desktop versions of Windows are released.

## Performing a Clean Installation

To install Windows Server 2003 on a server that is not configured with a previous operating system, set up the system so that it boots to the CD-ROM drive (using the computer's BIOS settings utility). The clean installation consists of two different phases: a text phase and then a Windows phase. During the text phase, you specify (and create, if necessary) the partition that will be used as the target for the Windows Server 2003 installation.

When the text phase is complete. The system reboots into a pre-Windows environment. The Windows phase of the installation consists of a series of Windows-based screens that enable you to select configuration items such as the computer's name, the time zone and time for the computer, and the password for the computer's Administrator account.

### Text Mode Installation Phase

1. Place the Microsoft Windows Server 2003 CD in the server's CD-ROM drive. Reboot the system, if necessary.
2. The server boots to the CD. After loading some initial setup files, the server provides you with the Setup Notification screen. To continue the installation process, press the Enter key.

3. The next screen (the Setup screen) provides you with the options of starting a new installation or repairing a previous installation. To continue with the “fresh” installation, press Enter.
4. The Windows Licensing Agreement appears. After reading the licensing information, press F8 to continue. (This means that you agree to abide by the agreement provided.)
5. On the next installation screen, you are asked to specify a partition that will be used as the target for the Windows Server 2003 installation. You can create a new partition or use an existing partition on the server. To create a new partition, select a drive (containing free space) on the server and then press C. You then must provide the amount of the free space on the selected drive that you want to use for the partition. Specify the space to use (in megabytes) and then press Enter.



You can also select an existing partition and delete the partition (or partitions). This enables you to “reconfigure” all the drives on the server and divide up the storage space on the server’s drives as you see fit.

6. The new partition is listed in the partition box. To install Windows Server 2003 on the partition (make sure the partition is selected), press Enter.
7. You are asked to format the new partition. You are provided with a choice of NTFS or FAT. Because domain controllers require an NTFS partition to run the Active Directory, you typically want to select NTFS. (If you will configure the server as a member server, such as a file server or an extra DNS server, FAT is okay, but NTFS is still preferred for all Windows servers because it provides a greater level of security.) Select the file format (using the arrow keys) and then press Enter.
8. The setup program formats the partition and then copies installation files to the server. After the appropriate files are copied, the server reboots. This ends the command-line portion of the Windows Server 2003 setup.

## Windows Installation/Configuration Phase

After the system reboots, the system runs the Windows configuration phase of your Windows Server 2003 installation.

1. The first screen asks you to customize language and regional settings for Windows. By default, the standards settings are set to English. The default location is set to the United States. You can use the Customize button to change the language or regional settings. To continue with the installation, click Next.



The Regional and Language options screen also allows you to change the input language for the server installation and the input device you use. The default is the U.S. keyboard layout.

2. On the next screen, provide your name and organization. Then click Next to continue.
3. Next you must provide your product key, which is on the back of your Windows CD case. After you enter the product key, press Next to continue.
4. The next screen asks you to select your licensing method. You can license your network either per server or per seat (see the discussion of the differences between the licensing modes found earlier in this hour). If you select Per Server (the default), specify the number of concurrent connections using the spin box. After you select the licensing mode, click Next.
5. You then are asked to supply a unique name for the computer and to enter the Administrator's password for the local computer. Type the computer name. Then enter and then re-enter the Administrator account password. Windows Server 2003 stresses the use of strong passwords. A strong password contains at least six characters; does not contain user, real, or company names; does not contain complete dictionary words; and contains a combination of numeric, alphanumeric, and non-alphanumeric characters. (More about passwords and Windows Server 2003 security is discussed in Hour 2, "Windows Server 2003 Security Overview.") After you enter the computer name and password, click Next.



If you enter a password that Windows Server 2003 does not consider strong, a message box appears letting you know what a strong password is. If you want to continue with your current password, click Yes. If you want to choose a new stronger password, click No.

6. The next screen enables you to set the time zone for your computer and the current date and time (if necessary). After you set these parameters, click Next to continue.
7. Next you are asked to configure the network settings for the computer. You can go with the default of the client for Microsoft Networks, File and Print Sharing, and the TCP/IP protocol. If you want to change this configuration, you can click the Custom settings option button on this screen. In most cases, it is probably easier to

- install additional network protocols such as NWlink (the Microsoft IPX/SXP-compatible program) after the serving is up and running. Click Next to continue.
8. You can choose whether this server belongs to a workgroup or a domain. The default setting is that the computer is not on a network or is on a network with a workgroup instead of a domain. The default workgroup name is WORKGROUP. Whether you will use the server in a workgroup or a domain, at this point it is best to go with the default and complete the Windows Server 2003 installation and configuration. Changing the workgroup name or making the server a member server of an existing domain is covered later in the hour. Press Next to continue.
  9. After you click Next, the installation program copies and installs files to your new Windows Server 2003 as it completes the installation process and configures your server's hardware and peripherals. After the installation is complete, the server reboots. After the server restarts, press Ctrl+Alt+Del. At the password prompt, supply the password you set for the Administrator account during the installation process. You will be logged on to the server.

When you are logged onto the server, the Manage Your Server Window appears. This provides you with the capability to add roles to your server and also provides links to Help information on the various roles that your server can play. For an overview of server roles, see Hour 5.

## Performing an Upgrade

If you are not in a position to do a clean install of Windows Server 2003, you can also upgrade an existing network operating system, such as Windows NT and Windows 2000. The actual upgrade process is very straightforward. But as already mentioned in this hour, the upgrade of a domain controller has consequences for the entire domain. Running mixed environments in which Windows NT servers must interact with servers running Windows Server 2003 (and perhaps even some Windows 2000 servers) makes supplying important network resources in the domain more difficult (and quite confusing at times). In an ideal situation, you will be able to upgrade all servers on the network to Windows Server 2003.

1. To perform an upgrade on a Windows NT or Windows 2000 Server, insert the Windows Server 2003 CD in the server's CD-ROM drive. Then click the Install Windows Server 2003 button on the Welcome screen that opens.
2. The Welcome to Windows Setup window appears. The Installation Type is set to Upgrade (see Figure 3.4). Click Next to continue.

**FIGURE 3.4**  
*Select Upgrade as the installation type.*



3. The Licensing Agreement screen appears. Select I Accept This Agreement (after reading the agreement) and then click Next to continue.
4. On the next screen, provide your Windows Server product key. Then click Next to continue.
5. The next screen provides you with the option of downloading any new setup files that have changed for Windows Server 2003 since you purchased the installation CD. The default is set to Yes, Download the Updated Setup Files. Click Next to continue.

You can now move through the screens provided by the Windows Server 2003 installation software to complete the upgrade of the server's current network operating system. These screens are many of the same ones provided in the "Performing a Clean Installation" section. Windows Server preserves settings on your upgraded server, such as domain controller settings and other services.



You can also install multiple Windows Server installations using the Remote Installation Services. This enables you to install Windows Server on several computers from an image of the server software. Remote Installation Services is discussed in Hour 10, "Client Computers and the Domain." You also can begin an installation on any Windows desktop software from the command prompt by using the `winnt.exe` executable file in the `I386` folder on the Windows Server CD-ROM. To do an installation on a server running Windows NT or Windows 2000, use the `winnt32.exe` file in the `I386` folder.

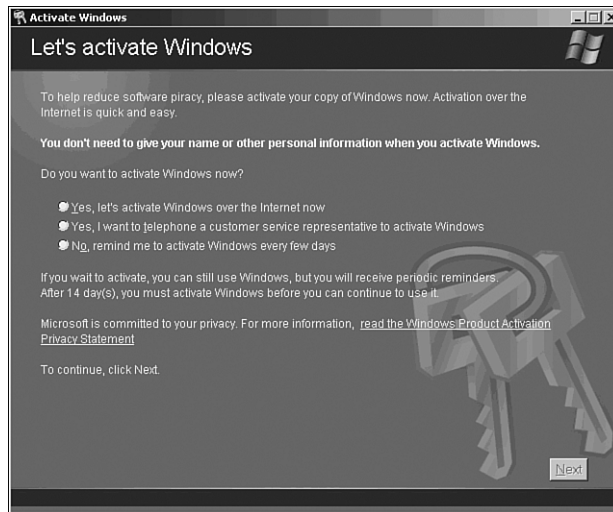
## Understanding Windows Product Activation

One of the first things that you will want to do after installing the server software is activate the product. To combat software piracy, Microsoft has developed a product activation strategy for its network operating systems, client operating systems, and applications such as Microsoft Office. You can activate your Windows Server 2003 software either over the Internet or by telephone. When you install Windows Server 2003, you might want to have the server hooked up to an Internet connection, even though the server might not be connected to the Internet when you actually put it into service on the network or in your Active Directory domain.

1. To activate Windows Server 2003, select the Activation word balloon (it appears as soon as you log on to the server for the first time), or click on the Activation icon in the system tray. The Activate Windows window opens (see Figure 3.5).

**FIGURE 3.5**

*Select the option  
Activate Windows over  
the Internet.*



2. The easiest way to activate the network operating system is to use the option Activate Windows over the Internet. Select this option and then click Next.
3. The next screen provides you with the option of registering your Windows Server 2003 with Microsoft as you activate the product. Choose the appropriate option button (either to register and activate or to activate only) and then click Next. If you select to register, the next screen requests registration information. Complete the form and then click Next (this screen is bypassed if you chose to activate only).
4. A connection is made to the Internet (and Microsoft), and your product is activated. Click OK to complete the process.

Windows Server 2003 is now activated, and you can configure the server for its various roles on the network.

## Choosing Between a Workgroup and a Domain

One aspect of a server's configuration that you should have determined long before installing Windows Server 2003 is whether the server will be part of a workgroup or domain.

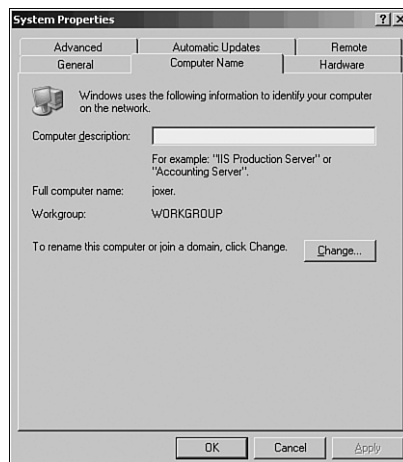
In a workgroup setting, a Windows server 2003 can supply services such as the Internet Connection Sharing feature, the Internet Connection Firewall, and file and print services.

In a domain, a server can be a domain controller, can supply services such as DNS and DHCP, or can serve as a router or remote access server. Windows Server 2003 is built to provide services on a domain, so deploying this server software on a domain really gives you more bang for your buck (instead of running a workgroup using the services that can be deployed by Windows desktop operating systems over an expensive server).

1. To make a server part of a workgroup or to add it as a member server to an existing domain, first select Start. Then right-click My Computer and select Properties. The System Properties dialog box opens. Select the Computer Name tab on the System Properties dialog box (see Figure 3.6).

**FIGURE 3.6**

*You can view the server's current membership on the Computer Name tab.*



2. To change the workgroup membership or to add the server to a domain, click the Change button. The Computer Name Changes dialog box opens (see Figure 3.7). You can change the computer's name and its domain or workgroup affiliation.

**FIGURE 3.7**

*You can change the server's name or membership.*



3. To add the server to an existing domain, select the Domain option button and then type in the name of the domain (you need to provide the Fully Qualified Domain Name of the domain, which includes prefix and suffix). Or, to add the server to a different workgroup, select the Workgroup option button and type in the name of the workgroup. When you complete either choice, click OK. It might take a moment, but you then are welcomed to the domain or the workgroup that you have specified.

## Summary

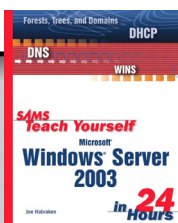
In this hour, we looked at installing Windows Server 2003. It is important to keep in mind that Windows Server 2003 requires a minimum hardware configuration and to ensure that your server uses server hardware on the Windows Server 2003 Hardware Compatibility List. Windows Server 2003 licensing can be done either per server or per seat. With per server mode, the server is licensed for a certain number of connections. With per seat mode, each connecting client has a license of its own. Licensing is managed in the Licensing snap-in.

To upgrade previous versions of the Windows server software to Windows Server 2003, make sure that you have installed the latest service packs for that version of Windows.

Also be sure to back up any servers that you will then upgrade. Upgrading Windows 2000 Server domains requires that the adprep utility be used to upgrade the Schema Master and Infrastructure Master on the domain.

## Q&A

- Q** What two hardware considerations should be an important part of the planning process for a Windows Server 2003 deployment?
- A** Any server on which you will install Windows Server 2003 should have at least the minimum hardware requirement for running the network operating system. Server hardware should also be on the Windows Server 2003 Hardware Compatibility List to avoid the possibility of hardware and network operating system incompatibility.
- Q** What are the possibilities for licensing clients in relations to your servers running Windows Server 2003?
- A** Client licenses can be handled in two different modes. The per-server mode provides a license for a definite number of concurrent connections to the server. The per-seat mode requires a license for each network user on the network. Recording and managing licensing is handled by the Licensing snap-in.
- Q** What are the options for installing Windows Server 2003?
- A** You can install Windows Server 2003 on a server not currently configured with a NOS, or you can upgrade existing servers running Windows 2000 Server and Windows NT 4.
- Q** What are the options for file systems on a new Windows Server 2003?
- A** Windows Server 2003 supports NTFS, FAT, and FAT32 partitions. It is a best practice to use NTFS on system volumes and any other volumes on which you want to have the added security provided by NTFS permissions. NTFS is required if you want to install the Active Directory to make the server a domain controller.



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